APPENDIX B
BUTLER'S GARTERSNAKE CONSERVATION PLAN FOR THE MENARDS OAK CREEK DEVELOPMENT

HABITAT RESTORATION & MANAGEMENT PLAN

CEDARBURG SCIENCE, LLC PROJECT #MEN-1124-03-03

The Menards Oak Creek property is an approximately 41.5-acre site that currently contains the existing Menards store, a residential home with a garage and other outbuildings, an existing stormwater pond, and undeveloped land. Development involving the expansion of the Menards store and reconstruction of the existing stormwater pond is proposed to occur within the west-central portion of the project area. In June 2004, an on-site Butler's Gartersnake habitat quality assessment was conducted (this report) and concluded that part of the site falls within a habitat patch classified as having Significant Conservation Value (Tier 3) for the Butler's Gartersnake, under current WDNR guidance (Figure 1).

The proposed expansion of the Menards store would impact approximately 8.7 acres of this snake habitat. This habitat management plan provides guidance for restoring any habitat area that may be disturbed during construction activities, and maintaining the undisturbed Butler's Gartersnake habitat in the Final Habitat Preserve Area.

The Final Habitat Preserve Area is bound by Johnston Park to the north, 20th Street to the east, undeveloped land to the south, and the Menards store to the west. Butler's Gartersnake thrives in areas containing diverse ground level flora with a significant grass component, which can develop only under fairly open canopy conditions. Clumping, hummocks, and structural diversity are preferred over uniform structure. The Final Habitat Preserve Area contains a variety of communities, including upland meadow, lowland hardwood forest, shrub-carr, fresh wet meadow, and shallow marsh plant communities. Upland meadow habitat comprises all of the upland areas of the Final Habitat Preserve Area, with the exception of a hedgerow along the southern boundary. Four wetland areas are present within the Final Habitat Preserve Area:

- A shallow marsh/shrub carr wetland complex occurs in the northwest portion, and extends off-site to the north.
- A lowland hardwood forest/fresh (wet) meadow wetland complex occurs in the southwest portion and extends off-site to the south.

- A small fresh (wet) meadow wetland is located along the south-central portion.
- A drainageway containing shrub carr, fresh (wet) meadow, and shallow marsh habitat occurs in the eastern portion.

The upland meadow habitat in the Final Habitat Preserve Area consists of early-successional, low-quality, fallow field vegetation. Dominant herbaceous species in this area include *Bromus inermis* (smooth brome), *Cirsium arvense* (Canada thistle), *Daucus carota* (Queen Anne's lace), *Elytrigia repens* (quack grass), *Poa pratensis* (Kentucky bluegrass), and *Solidago canadensis* (Canada goldenrod). Scattered small shrubs of *Cornus sericea* (red-osier dogwood), *Crataegus* spp. (hawthorn), *Rhamnus cathartica* (common buckthorn), and *Rosa multiflora* (multiflora rose) are also present. Management of the upland meadow habitat will involve removal of invasive, non-native species such as buckthorn and multiflora rose, to prevent them from dominating the meadow and degrading the habitat. The on-site wetlands described above were characterized as moderate to good quality Butler's Gartersnake habitat in the habitat assessment, so management in these areas will be limited to long-term control of non-native invasive woody species.

As stated earlier in this conservation plan, during site construction portions of the western end of the Final Habitat Preserve Area will be disturbed as part of the stormwater pond enlargement. All disturbed areas within the Final Habitat Preserve Area (including the slopes of the stormwater pond) will be re-vegetated so as to restore habitat suitable for the Butler's Gartersnake.

There are two defined areas for which this plan outlines habitat management measures to be conducted. These areas include: (1) the Temporary Habitat Impact Area (which includes the slopes of the stormwater pond as well as any other areas within the Final Habitat Preserve Area that may be disturbed; shaded in pink on Figure 3); and (2) the No Habitat Impact Area (shaded in green on Figure 3).

MANAGEMENT RECOMMENDATIONS

With respect to the goal of managing the subject site for Butler's Gartersnake habitat, a multi-faceted approach is planned. The components of the recommended plan are: (1) re-vegetation

of the areas that will be graded and disturbed (i.e., Temporary Habitat Impact Area), (2) management of the existing vegetation in the No Habitat Impact Area, and (3) follow-up monitoring and maintenance.

Planting Plan

The planting plan involves seeding all disturbed areas within and near the Temporary Habitat Impact Area with an upland meadow seed mix (Table 1). Seeding will occur in Spring or Fall 2005, depending on the completion of the grading activities. All seeding efforts shall be completed no later than November 15, 2005. No seeding shall occur between July 1, 2005 and October 15, 2005. The origin of all seed shall be of local genotype (from within a 100-mile radius of the subject site). A cover crop of annual oats or winter wheat shall be incorporated in the upland meadow seed mix.

The seed mix that is recommended below consists of a variety of herbaceous plant species. This native mix contains species that occur naturally and thrive with minimal to no long-term management. Some of the species included in these mixes are currently present at the site. The combination of these species will provide a dense ground cover and sufficient vertical stratification in the herbaceous layer.

Due to the unpredictability of seed supply, a selection from the following list will be allowed, provided the minimum species of each type are included. Incorporation of all species listed is preferred if the seed stock is available. A minimum of 3 grasses and 9 forbs shall be included in the selected seed mix; both listed legumes shall be included. Any substitutions to the seed mix need to be approved by Cedarburg Science staff, Wisconsin Department of Natural Resource (WDNR) staff, or another qualified ecologist.

Table 1. Recommended Seed Mix for Upland Meadow and the Slopes of the Stormwater Pond.

Scientific Name	Common Name	Plant Type
Aster azureus	sky blue aster	forb
Aster sagittifolius	arrow-leaved aster	forb
Baptisia alba	white false indigo	forb
Carex vulpinoidea	brown fox sedge	sedge
Desmodium canadense	Canadian tick-trefoil	legume
Elymus canadensis	Canada wild rye	grass
Euphorbia corollata	flowering spurge	forb
Eryngium yuccifolium	rattlesnake master	forb
Festuca obtusa (subverticillata)	nodding fescue	grass
Heliopsis helianthoides	sunflower-everlasting	forb
Lespedeza capitata	bush-clover	legume
Liatris pychnostachya	prairie blazing star	forb
Monarda fistulosa	wild bergamot	forb
Panicum virgatum	switchgrass	grass
Ratibida pinnata	yellow coneflower	forb
Rudbeckia hirta	black-eyed Susan	forb
Schizachyrium scoparium	little bluestem	grass
Silphium terebinthinaceum	prairie dock	forb
Solidago rigida	stiff goldenrod	forb
Solidago speciosa	showy goldenrod	forb

The Temporary Habitat Impact Area (shaded in pink on Figure 3) shall be planted with the above seed mix at a rate of 12.0 pounds pure live seed (PLS) per acre. The seed mix shall be composed as follows:

Grasses	- 8 lbs PLS/acre
Forbs and Legumes	- 4 lbs PLS/acre
TOTAL	- 12 lbs PLS/acre

No one grass species shall comprise greater than 33% or less than 10% of the total weight of the grasses within the mix and no one forb or legume species shall comprise greater than 15% or less than 5% of the total weight of forbs and legumes within the mix.

The seedbed shall be prepared properly to insure an adequate planting bed for the native seed. A depth of at least 6 inches of organic topsoil shall be verified prior to seeding. If areas are found to contain less than the minimum requirement, additional topsoil shall be placed over those areas. Prior to seeding, the top 4-6 inches of the soil surface shall be disked to loosen the soil, break up soil clods, and provide a uniform texture to the soil. All medium to large

cobble (greater than 1 inch) and woody debris shall be removed from the seeding areas. Seeding shall occur immediately following the seedbed preparation.

The seed mix shall be mixed with moist sand or sawdust at a 10:1 ratio (10 parts sand or sawdust to 1 part seed) to obtain an even distribution of the seed and help to hold it in place. The seed can be mechanically or hand-broadcast and raked lightly (using a leaf rake, or equivalent) to further ensure even distribution of the seed and good contact. However, the seed shall not be raked into the soil deeper than ½-inch from the soil surface. Seed shall be sown when rain is forecast within 24 hours of the seeding to aid in providing soil-to-seed contact. If not, watering shall be done immediately following the seed application.

A cover crop shall also be mechanically or hand-broadcast over the entire seeding area at a rate of 15.0 pounds per acre. Annual oats (*Avena sativa*) shall be used as the cover crop if the site is seeded prior to September 15, 2005. If the seeding occurs after September 15, 2005, winter wheat (*Triticum aestivum*) shall be seeded.

The seeded areas shall then be covered with erosion control materials—clean straw mulch shall be used in areas of gradual grade (greater than 1:6 slopes) and a wildlife-friendly erosion control blanket (such as North American Green products S75BN or S150BN) shall be used on slopes with a grade greater than 1:6. It is very important that the contractor use clean mulch free of any weed seeds. Any germinating weed seeds within the straw mulch could out-compete the target species that are planted, thus reducing the germination rate of the seeded species. This reduced germination rate would be an indicator of a failed restoration. If it is apparent that the straw mulch was not clean or free from weed seeds, the contractor shall be responsible for remedying the situation. A common species found within mulch containing weed seeds is Canada thistle.

Management of Re-vegetated Portions In and Near the Temporary Habitat Impact Area

A crucial component to managing the subject site involves invasive species control during the first few growing seasons. Annual weeds will likely be the first plants to appear in the disturbed area. This area shall be mowed with a flail or sickle to cut weeds off before they set seed (late spring - summer). The following steps shall be taken in order to minimize snake mortality from mowing:

1) Mowing shall be done in a patch rotation, with no more than 33% of the available grassland habitat affected in any one year. The area to be mowed shall contain the worst infestation of weeds, as determined by Cedarburg Science, or another qualified ecologist.
2) Mowing shall be performed when weather conditions are most likely to avoid snake activity (during the hottest period of the day when sunny conditions prevail and air temperatures exceed 80º F, or on very cool, overcast days when temperatures are below 50º F).
3) Mower blades shall be set at a minimum of 10 inches off the ground, since grasses maintained under 8 inches are less likely to provide useful habitat for this species.

Other control measures, such as herbicide applications, may be needed if mowing does not sufficiently reduce weed coverage. The type and amount of control needed should be determined by Cedarburg Science staff, or another qualified ecologist, during the annual monitoring, and must be approved by WDNR. As the native grasses grow and spread, thereby reducing the amount of bare soil, weeds shall decline significantly.

Management of Undisturbed Portions of the No Habitat Impact Area

Invasive species management is also vital to preserving and managing the No Habitat Impact Area. Invasive species to be targeted for control include *Lonicera* spp. (bush honeysuckle), *Rhamnus cathartica* (common buckthorn) and *Rosa multiflora* (multiflora rose). It should be noted that many of the management techniques described below are based on guidance provided by the Wisconsin Department of Natural Resources (*Wisconsin Manual of Control Recommendations for Ecologically Invasive Plants*, published in May 1997).

Bush Honeysuckle, Common Buckthorn, and Multiflora Rose Management

Common buckthorn is scattered throughout the upland and wetland portions of the No Habitat Impact Area. Several individual multiflora rose and bush honeysuckle shrubs are also present. All buckthorn, bush honeysuckle, and multiflora rose are to be removed from the No Habitat Impact Area in early winter 2005 - early spring 2006. A professional experienced in identifying these species during the dormant season shall locate and mark individual shrubs immediately prior to any cutting activities. While there are several techniques available for controlling these

targeted invasive species, we recommend the methods described below as they have been found to be the most effective.

The buckthorn, honeysuckle, and multiflora rose shrubs are to be cut at a height no greater than three inches from the ground surface. The cut stumps are to be immediately treated with a 30% active ingredient solution of triclopyr that is formulated for oil dilution (e.g. Garlon IV). It is important that the herbicide be applied with a small brush or wick applicator to each cut stump within 30 seconds following the cutting of the stump. If more than 30 seconds pass, the stump shall be re-cut followed by immediate application of the herbicide. A small brush, sponge applicator, or wick applicator is required to maintain control of the herbicide application and prevent splashing on adjacent vegetation. Spray applicators shall not be used for applying herbicide to the stumps.

All shrub cutting and herbicide applications shall be performed during the dormant season between the months of October through mid-February, before the sap begins to move from the roots to the stems of the shrubs. All cut woody vegetation is to be removed from the site and properly disposed of off-site by the contractor. All remaining stumps are to be left intact and not grubbed out. This will minimize damage to the surface soil and established vegetation. More importantly, as these stumps begin to decompose, they may provide suitable subsurface cavities for Butler's Gartersnake hibernation.

Follow-up Monitoring and Maintenance

The success of the re-vegetation and management efforts outlined above can only be measured by conducting follow-up monitoring. Success of the re-vegetation and habitat management will be based on seed germination and success of the invasive species control.

Monitoring Planted Areas

The seeded areas shall be annually monitored for 5 years. This monitoring shall occur between June 1 and September 1, although monitoring during the first growing season after the seeding (i.e. 2006) shall occur no earlier than July 1, 2006, in order to allow adequate time for germination of the seeded vegetation.

Extensive vegetation monitoring is not essential during the annual monitoring; however, some limited quantitative monitoring shall be employed to ensure that the plantings did not fail. The quantitative sampling shall involve two parameters: percent cover of represented species and species composition of the seeded areas.

A primary goal of this project is to restore the disturbed areas to a community rich in native vegetation. The goal of the seeding is therefore to have at least an 80% germination rate of the seeded plant species. This may be difficult to achieve because the seeding area currently contains, and is surrounded by, many aggressive, invasive herbaceous species such as Kentucky blue grass and smooth brome. Kentucky blue grass and smooth brome are utilized to some extent by Butler's Gartersnakes, however, so the presence of these species shall not compromise habitat suitability unless they become dominant and reduce the overall structural diversity of the ground flora community. As such, if it is determined that an 80% germination rate of the seeded species has not been achieved at the end of the 5-year monitoring period, further assessment of the area shall be made to determine whether or not suitable Butler Gartersnake habitat has been re-established.

Long Term Management Guidance for Butler's Gartersnake Habitat

(This guidance may be periodically updated by the Wisconsin Department of Natural Resources)

Periodic maintenance is needed for maintaining native wetland, grassland, prairie, or savanna ecosystems as suitable habitat for Butler's Gartersnakes. The management objective is to maintain good ground cover of native grasses and other herbaceous plants, which provide cover for snakes. These plants require relatively open canopy conditions for sufficient sunshine. Therefore, periodic control of excessive growth of woody shrubs and trees must be performed. While such woody growth is in part a natural succession, such open communities were maintained naturally by grazing and fire. In addition, several invasive species can compromise habitat quality, and shall not be allowed to form large stands (i.e. reed canary grass, cattail, giant reed grass). These guidelines are meant for maintaining already good quality habitat, rather than as a plan for eradication of large stands of invasive species. If there are major invasive species problems on site, a qualified restoration ecologist shall be consulted.

For general maintenance and control of woody vegetation, any of the following methods may be used on a rotation of once every 3-5 years:

1. Selective Brush/Tree-Cutting: This is the preferred method for small scale, general maintenance. Selective cutting (i.e. chain saw) may be done without restriction. Herbiciding of cut stems immediately after cutting is recommended as per label instructions (i.e. glyphosate, see also DNR guidelines for herbicide use online).

2. Burning:
    a. If burning will be done between November 6 and March 15, there are no restrictions.
    b. If burning will be done between March 16 and November 5, then only up to 25% of the available grassland habitat for that site shall be burned in any one year.

3. Mowing/Haying: Herbaceous mowing and brush-mowing shall be done as follows:
    a. If mowing will be done between November 6 and March 15, there are no restrictions (for brush, this time frame is generally feasible).
    b. If mowing will be done between March 16 and November 5, then:
        i. Conduct mowing in small patches in a rotational pattern, with no more than 33% of the available grassland habitat on the site affected in any one year.
        ii. Mower blades shall be set a minimum of 8 inches off the ground.
        iii. Conduct when weather conditions are most likely to avoid snake activity:
            1. During the hottest period of the day when sunny conditions prevail and air temperatures exceed 80° F, OR
            2. On very cool, overcast days when temperatures are below 50° F

4. Grazing: Light-to-moderate grazing (<1.0 head per acre) may be used in rotations among habitat patches, with no more than 33% of the available habitat on the site grazed in any one year. Grazing shall be discontinued in a patch as soon as 50% of the grasses and forbs in a grazed patch are cropped to 8 inches in height.